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Evaluation of Postoperative Pain Control Following major Surgery at Mulago Hospital

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Background: ***Postoperative pain following major surgery contributes greatly to postoperative morbidity and anxiety. This makes postoperative pain control a factor, not only in Africa but worldwide. Once postoperative pain is controlled adequately and effectively, the patient's general condition and satisfaction are improved considerably, leading to early mobilization and shorter hospital stay. The main objective of the study was to evaluate the methods and practices of postoperative pain management, following major surgery in the department of Surgery at Mulago Hospital, with the aim of identifying the gaps that contribute to unsatisfactory postoperative pain control and highlighting the need for a pain management protocol.***
Methods: ***This was a cross-sectional, observational and descriptive study of the patients undergoing laparotomy in the department of Surgery, over a 7-months period. Laparotomy was chosen to represent a common form of major surgery. Every patient who was included in the study was assessed and interviewed, at 6 hours and 24 hours postoperatively, using a pre-tested questionnaire. The Numerical Visual Analog Scale (labeled 1-10) was the tool used for pain assessment, for all the 132 patients in this study. The patients' ages ranged from 18 to 70 years. The study variables included pain severity, type of analgesic, dosage, interval between doses, route of administration, while relating them to the operative procedure. Data was collected using a pre-tested Questionnaire, and analyzed using the SPSS version 10.0 software.***
Results: ***The prevalence of postoperative pain among the 132 study patients was 100%. The commonest route of analgesics administration was by intramuscular injection, during the first 24 hours postoperative period. Pethidine was used in 58% of the cases. By 24 hours postoperatively 47% of the patients were on Diclofenac only. Whereas Pethidine offered better postoperative pain control than Diclofenac (P=0.012), a combination of the two gave the best pain control. The mean pain scores for the different operative procedures were within the same ranges, without significant differences. The majority (53%) of the participants indicated that postoperative pain control was not satisfactory.***
Conclusion: Postoperative pain was not adequately controlled following major surgery. There is need to review and improve the methods and practices of postoperative pain management, especially in the first 24 hours.

Introduction

Before the use of patient controlled analgesia (PCA) in the developed world, postoperative pain was a major global cause of morbidity and concern following major surgery [1, 2, 3]. In countries where PCA is not available pain management is done the traditional way, by the nurses administering analgesics following the doctor's prescription. The techniques of pain control vary from one centre to the other. It is always presumed that the severity of pain varies with the extent of surgical trauma and the general state of the patient's health. It is also influenced by the patient's psychological state [4,5].

Postoperative pain has been a global challenge for centuries, claiming the attention of many surgical and research centers worldwide [6,7,8,9]. When postoperative pain is adequately controlled, regardless of the type of operative procedure, early mobility, patient's confidence

ISSN 2073-9990 East Cent. Afr. J. surg

and satisfaction are significantly improved [10, 11]. Severe postoperative pain has both negative and psychological consequences to the patient, contributing to the morbidity and dissatisfaction in the care offered by the ward staff. Studies from various parts of the world suggest that postoperative pain is often inadequately controlled or managed due to various reasons which tend to change from one region to another [7,12,13]. It is an even greater challenge in the developing world where facilities such as ward staff, drugs, equipment, are limited [7, 10].

At Mulago hospital pain is a common complaint among patients, especially following major surgery. As a result, a significant number of patients are hesitant to accept early ambulation, or early discharge from hospital. Some develop complications such as respiratory infection as a result of inability to breathe normally [12]. The factors influencing the inadequate postoperative pain control were hitherto not documented, because no study of this kind had been carried out before in this setting.

Pain control techniques

A range of treatment regimens is in use for postoperative pain control. By the time this study was undertaken, no analgesic administration and pain control protocol had been put in place at Mulago Hospital. While some patients were given opiate analgesics, others got non-steroidal anti-inflammatory analgesics (NSAIDS), and a few were given a combination of the two. Quite often the criteria used were not clear. Sometimes the decision was influenced by what was thought to be available in stock. A number of surgical centers in different regions make use of different methods for postoperative pain control such as PCA, infiltration with local anesthetics, pre-emptive analgesia, small frequent doses of opoids, NSAIDS, etc.

Pain has a significant psychological aspect. Whereas anxiety, apprehension and disappointment tend to increase or prolong postoperative pain, it has been observed that distraction, psychotherapy, and attention from loved ones tend to reduce or downplay the feeling of it [13, 14, 15, 16]. In the developed world, PCA is the mainstay of postoperative pain control. It has the advantage of ensuring independence (autonomy) in the management of one's pain.

The purpose of this cross-sectional observational study was to examine the existing ways and techniques of postoperative pain control at Mulago Hospital, with the aim of identifying the areas that need to be addressed, for improvement.

Patients and Methods

This was a descriptive cross-sectional study. It was carried out at Mulago Hospital, a National Referral and teaching Hospital, situated in the capital city of Uganda. It was conducted on the general surgical wards. The Study Population comprised of all the patients above 18 years and not more than 70 years, who underwent laparotomy and were fully in control of their cognitive faculties, and were willing to consent and participate.

The patients who had had laparotomy but were unable to give the required information (moribund, mentally unstable) were excluded from the study. Also excluded were those that declined to consent and the patients who were operated during late hours of the day (after 2.00pm). This was to avoid interviewing them at night. The study population was recruited into the study on each ward by the consecutive sampling method until sample size was realized. A total number of 132 patients was obtained for this study. (Kish&leslie formula, 1965). An Informed consent was obtained from each of the participants to be recruited in the study. A detailed explanation of the objectives and contents of the study as indicated on the consent form was given to every participant prior to the onset of the interview. This included a session on the Visual Analog Scale, which was used as the pain assessment tool throughout this study.For every participant the interviews were conducted twice: 6hours and 24hours postoperatively.

ISSN 2073-9990 East Cent. Afr. J. surg

The only Day-Care laparotomy patients who were included in the study were those who were operated before 2.00 pm. This time limit was to ensure that the participants were not disturbed late at night. In a situation where a participant was found in severe pain or any other problem, the nurse or Doctor on duty was informed. One questionnaire was used for each participant for both visits, to ensure quality control. The study variables included the presence and severity of pain, the type of analgesic prescribed, the timing between doses of analgesics, the diagnosis and type of operation, and the route of administration of analgesic.Data was managed using the EPI-INFO-2004, version 6.02 programme and later exported to the SPSS version 10.0 software. Categorical variables were summarized into frequencies, percentages, bar-graphs and pie-charts for easy description. All the information obtained from the patients was strictly confidential, and all the participants signed informed consent forms.

Results

All the studied patients experienced some degree of pain, implying that postoperative pain prevalence was 100%. This is shown in table 1, which also indicates that the gender difference was not significant. Table 2 shows how the commonly prescribed analgesics were distributed among the study patients and their level of pain control at 6 hours and 24 hours postoperatively. The effect of using a single analgesic was compared with that of using a combination of both analgesics simultaneously.

Table 1. Presence of pain, by gender difference.

	At 6 hours		*At 24 hours*	
Pain	**Male**	**Female**	**Male**	**Female**
Present	96	36	93	35
Absent	0	0	3	1
% Pain Presence	100	100	97	97

Table 2. The Mean Pain Scores by prescribed Analgesic at 6 hours and 24 hours postoperatively

Analgesic	**Number**	**Mean Score**	**SD**	**F-value**	**P-value**
6 hours					
Pethidine	77	7.29	1.6	4.569	0.012
Diclofenac	26	7.39	1.7		
Combined	29	6.21	2.2		
Total	132	7.06	1.8		
24hours					
Pethidine	34	5.47	1.2	26.591	0.000
Diclofenac	65	5.53	1.1		
Combined	33	3.82	1.3		
Total	132	5.08	1.4		

Table 3. The Presciption patterns of Analgesics, at 6 hours and 24 hours postoperatively

Post op time	**Pethidine**	**Diclofenac**	**Combined**	**Tramadol**	**Total**
6 hours	34 (26%)	52 (39%)	14 (11%)	32 (24%)	132
24 hours	14	64	-	22	100
Total	48	116	13	52	

ISSN 2073-9990 East Cent. Afr. J. surg

Table 4. Time at which the last dose of analgesic was given, by 24 hour postoperatively.

Hours	Frequency	%
1	8	6.1
1.5	1	0.8
2.0	1	0.8
2.5	17	12.9
3.0	13	9.8
4.0	34	25.8
4.5	1	0.8
5.0	25	18.9
6.0	25	18.9
7.0	2	1.5
8.0	4	3.0
12.0	1	0.8
Total	132	100

The timing and interval between doses were faulty for many of the patients. Some patients got fewer doses of analgesics than those prescribed because of erroneous timing between doses. Table 4 shows that a survey taken at a randomly selected point in time to check on the time at which the last dose of analgesic was given varied widely. The quality of postoperative pain control was looked at in view of the various types of operative procedures under laparotomy as indicated in Tables 5 and 6.

Table 5 indicates that the differences between the mean pain scores for the different operative procedures were not significant, both at 6 and 24 hours postoperatively. The effect of a single analgesic versus combined analgesics on pain score for every surgical procedure category was evaluated. The mean pain scores are indicated in Table 6. The table also shows the mean pain scores for the different operative procedures. The mean pain score differences between one operative procedure and another were not significant, but the differences between a single analgesic and combined analgesics in pain control were significant. (P values: 0.000, 0.002, 0.004, and 0.044)

The evaluation of the patients about the postoperative pain control offered to them is summarized in Table 7. The terms used were later rated as being Excellent (80%-100%), Very Good (65%-79%), Good (50%-64%), Fair (40%-49%) or Poor (<40%). The majority (53%) indicated that the postoperative pain control was not satisfactory. The demographic characteristics of the study population were intended to avoid the extremes of age.

The study reveals the presence of postoperative pain among the study patients was very high (100%), regardless of gender difference. More than half of the patients experienced moderate to severe pain by 6 hours and mild to moderate pain by 24 hours postoperatively.

The prevalence of postoperative pain in this study was comparable to the study in Guyana, in which 200 patients were studied for postoperative pain at 24 hours; 61% had severe pain, 30% had moderate pain, 9% had mild pain.(Total prevalence=100%)(4,7,28) .

ISSN 2073-9990 East Cent. Afr. J. surg

Table 5. Types of Operative Procedures and mean pain scores at 6 and 24Hours Post Operatively

Operative procedures		6 hours		24 hours	
	Number	Mean	SD	Mean	SD
Cholecystectomy	9	8.00	1.7	**6.11**	**1.8**
Splenectomy	3	8.00	0	**6.33**	**1.5**
Appendicectomy	29	7.24	1.8	5.10	**1.3**
Exploratory Laparotomy	33	7.12	1.8	5.18	**1.4**
Repair of inc hernia	2	7.00	1.4	4.50	**0.71**
Resection and Anastomosis	30	6.83	**1.9**	4.9	**1.4**
Repair of Obstructed Hernia	18	6.67	**1.6**	**4.83**	**1.1**
Laparotomy and larvage	5	6.40	**2.2**	**4.6**	**1.1**
Perforated PUD Repair	1	6.00	-	6.00	-
Others	2	7.50	2.1	4.00	1.4

Table 6. Types of Operative Procedures, Analgesic Given and the Mean Pain Scores at 24 Hours Post Operatively. (Analgesics were given as either single or combined)

Operative procedures	Analgesic	No.	Mean	SD	Difference	T-Value	P-value
Cholecystectomy	Single Combined	7 2	6.71 4.00	1.4 1.4	2.714	2.444	0.044
Splenectomy	Single Combined	2 1	7.00 5.00	1.4 -	-	-	-
Appendicectomy	Single Combined	25 4	5.24 4.25	1.2 1.5	0.990	1.451	0.158
Exploratory Laparotomy	Single Combined	25 8	5.56 4.00	1.2 1.4	1.56	3.081	0.004
Repair of incisional hernia	Single Combined	1 1	5.00 4.00	- -	-	-	-
Resection and Anastomosis	Single Combined	21 9	5.57 3.33	0.75 1.3	2.238	5.928	0.000
Repair of Obstructed Hernia	Single Combined	14 4	5.21 3.50	0.80 1.00	1.71	3.59	0.002
Laparotomy and larvage	Single Combined	2 3	5.00 4.33	0.00 1.5	0.67	-	0.586
Perforated PUD Repair	Single Combined	1 -	6.00 -	- -	-	-	-
Others	Single Combined	1 1	5.00 3.00	- -	-	-	-

ISSN 2073-9990 East Cent. Afr. J. surg

Table 7. The opinions of the participants about the postoperative pain control.

Grade of Pain	Frequency	%
Excellent	1	0.75
Very Good	23	17.4
Good	38	29
Fair	59	45
Poor	11	8
Total	**132**	**100.0**

Discussion

The common practice of postoperative pain control at Mulago Hospital was by use of intramuscular injections of opoids (pethidine) or NSAIDS (Diclofenac), or occasionally a combination of the two. Routinely, doctors prescribed and the Nurses carried out the drug administration usually at 8 hourly intervals. This is still the common practice in many parts of the world, especially developing countries where PCA is not in use. Prescribed and administered properly, this technique can provide very satisfactory analgesia following major surgery or trauma.

Postoperative pain control depends significantly on the type of analgesic used, dose and frequency of administration**.** This study has revealed a number of otherwise avoidable problems regarding the practices of Postoperative pain management as the main factors responsible for the high prevalence of Postoperative pain. Single analgesics (Pethidine or Diclofenac) were not able to attain satisfactory levels as compared to analgesic combinations, although Pethidine was found to be superior to Diclofenac in pain control. The prescribed analgesic regimens and doses varied according to the doctors' preferences, but they were mainly in doses of 50-100mg Diclofenac or 50-100mg Pethidine. Only 20% received the prescribed doses on time while 42% received a single dose of the prescribe analgesic and for the subsequent doses there was a shift from pethidine to diclofenac, regardless of what was prescribed. In a number of cases, the patients got only two of the doses of analgesic instead of the usual three in the first 24hours.
The Doctors spend very little time with patients mainly during ward rounds, whereas the nurses are few and very busy with the ward schedule. The much needed psychotherapy was often missed. Most of the nurses on duty asked about the unsatisfactory quality of postoperative pain control on the wards, mentioned several factors that they thought were associated with the problem. Among these were the following:

- Understaffing in the overcrowded wards especially for evening and night duties.
- The tight restrictions involved in accessing "controlled drugs" such as Pethidine.
- Drug stock-outs; sometimes the patients had to buy their own analgesics.

Most of the patients here, and perhaps in many parts of Africa, expected pain postoperatively, but were reluctant to communicate this to the staff on the wards, until when the situation became critical. Like in many hospitals in Uganda evening and night duties were more problematic because of reduced nurse-staffing on the wards.
It was observed that the diagnosis and type of operative procedure, within the confines of laparotomy did not have significant influence on pain severity or its control. The mean pain severity scores were found to be in close range, both at 6 hourly and 24 hourly postoperatively.

The patients' opinions about the postoperative control they received were assessed using rating expressions such as Excellent, very Good, Good, Fair, Poor. Only 0.75% said excellent, 17% Good, 28% Good, 45% Fair, and 8% Poor. For purposes of interpretation in this study, all those

ISSN 2073-9990 East Cent. Afr. J. surg

below Good were regarded to have had unsatisfactory pain control. These amounted to 45%+8%=53%, which is really significant.

Conclusion

1. Postoperative pain following laparotomy (major surgery) was inadequately controlled at Mulago Hospital.
2. There was a high prevalence of Postoperative pain (100%). 64% of patients experienced moderate to severe pain, and 36% mild pain at 6hours; 78% had mild pain and 22% moderate pain at 24 hours following laparotomy.
3. Pain assessment was not routinely done, and sometimes unconventional methods were used when it was done, yet it would have been a good guide in pain control.
4. Pethidine (intramuscularly) was more effective than diclofenac for Postoperative pain control; however a combination of both as alternate or simultaneous injections gave better analgesia than each single drug. A number of factors were responsible for the prevalence of postoperative pain among the studied patients: the widely spaced analgesic doses by the prescribing clinicians, inconsistent timing of doses, inconsistent supplies of analgesics by hospital administration, and inconsistent pain assessment are the main ones; some of the issues concerned the Nursing staff.
5. The influence of the type of operative procedure on the quality of postoperative pain control was not significant.

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